

PRIVILEGED

ASARCO EAST HELENA SMELTER SITE EPA RCRA OVERVIEW

1117076 - R8 SDMS

- Regulated under RCRA since August 1980
- EPA lead for RCRA program until 1984 state authorization
- 1998 Asarco & EPA entered into federal Consent Decree for CWA & RCRA alleged violations
- Site-specific CD Components: penalty, SEP, assumption of RCRA lead for characterization and remediation of smelter soils and groundwater contamination on and offsite
- CERCLA retains lead for most area soils contaminated by historic Asarco activities
- Asarco is authorized by CD to apply for approval to construct up to 3 CAMU cells

WORK COMPLETED UNDER RCRA CD

- Current Conditions/Release Assessment Report, approved Feb. 1999
- CAMU CONSTRUCTION:
 - CAMU Cell 1, completed 2001
 - CAMU Cell 2, constructed 2008
- Interim Measures Work Plan, approved May 2000
- Interim Measures Work Plan Addendum for GW, November 2005
- Phase 1 RCRA Facility Investigation Report approved 2006
- Selenium identified as constituent of concern in groundwater in 2006
 - Additional efforts to delineate extent and identify source areas
- Certain Arsenic Source Control Measures Implemented 2006 & 2007
- RFI Phase 2, including risk assessment, commencing in 2009
- Ongoing long-term monitoring (existing CERCLA requirements integrated with RCRA requirements)



2008 CAMU Waste in Foreground, 3 Former White Acid Tanks, Blast Furnace Stack and 1 of Coverall Buildings in Background



CSHB and Temporary Liners

GROUNDWATER & SURFACE WATER MONITORING

- Groundwater & surface water monitoring performed since 1991
- Current monitoring schedule:
 - Monthly: 3 wells on Gail Street
 - Quarterly: 55 wells
 - Semi-annually: 120 wells and 6 surface water sites
 - Annually: additional 22 residential and public water supply wells added to semi-annual list of monitoring sites
 - Ongoing: open invitation by Asarco to monitor anyone's private well in East Helena upon request

SOURCE CONTROL MEASURES

- Addresses 2 major arsenic source areas
 - Asarco estimates these areas contributed 99% of mass loading of arsenic to groundwater plume
- Former Acid Plant Sediment Drying Area, Fall 2006
 - Encapsulation by slurry wall
 - Installation of temporary cap to be followed by permanent cap
- Speiss/Dross Plant Area, Fall 2007
 - Encapsulation by slurry wall
 - Installation of temporary cap to be followed by permanent cap



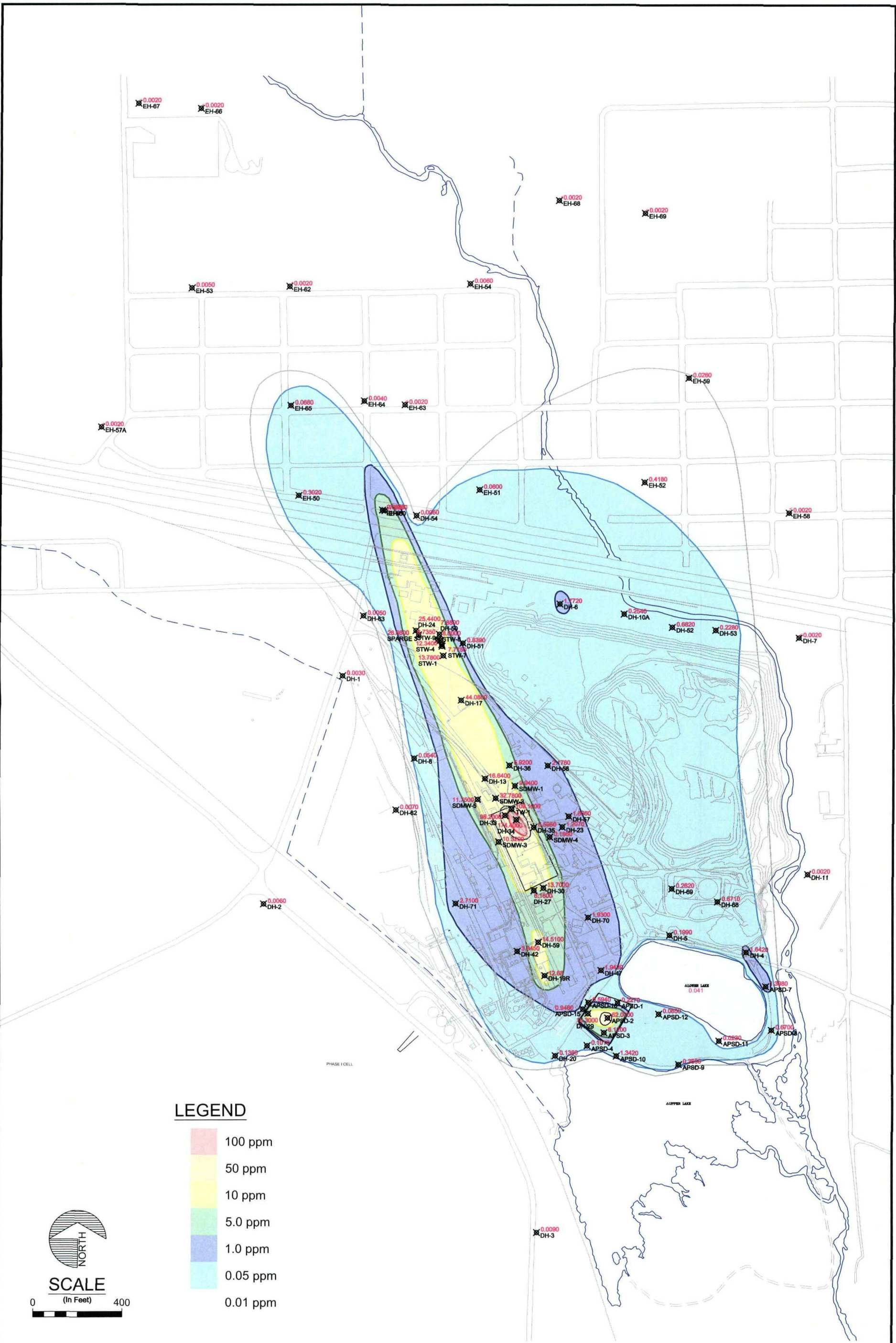
Source Control Measure at Former Acid Plant Sediment Drying Area, Slag Pile and Water Storage Tanks in Background

ARSENIC & SELENIUM GROUND WATER PLUMES

Primary Arsenic Sources to Groundwater

- Former Speiss/Dross Plant
- Former Acid Plant Sediment Drying Area

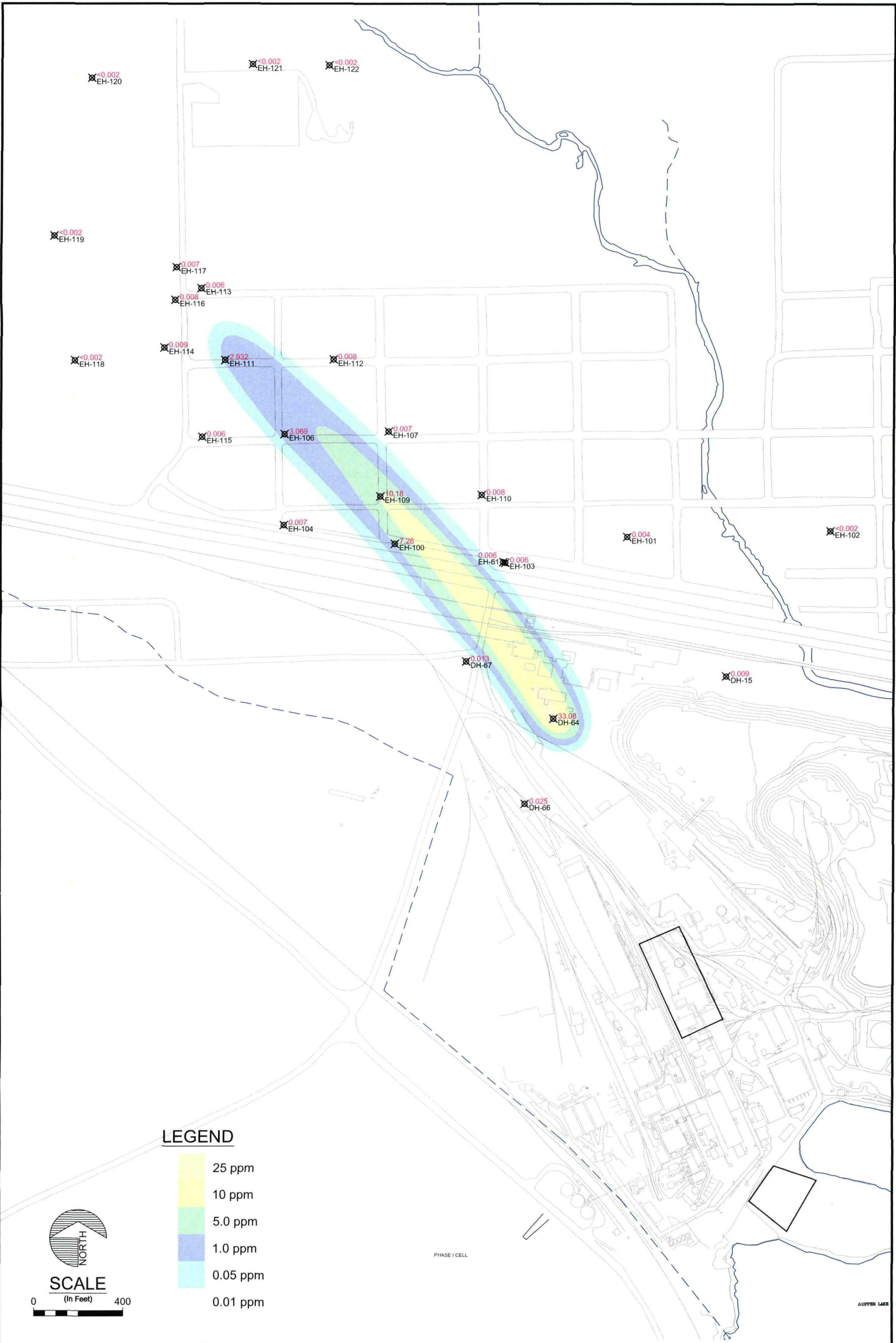
Selenium Source Area Identification Ongoing



EAST HELENA FACILITY, FORMER
ACID PLANT SEDIMENT DRYING AREA
SLURRY WALL, MONITORING
OPERATION AND MAINTENANCE REPORT

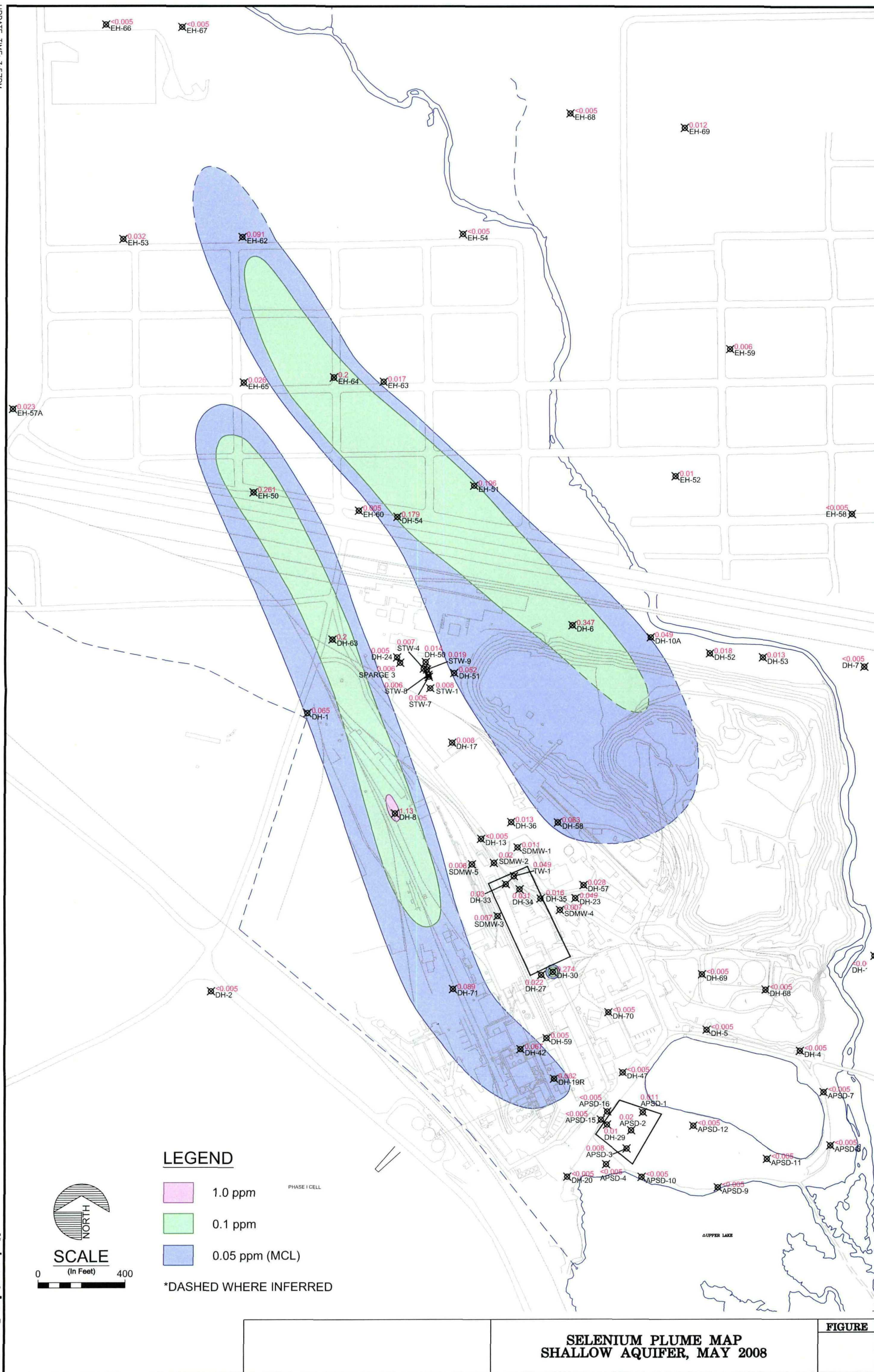
ARSENIC PLUME MAP
SHALLOW AQUIFER MAY 2008

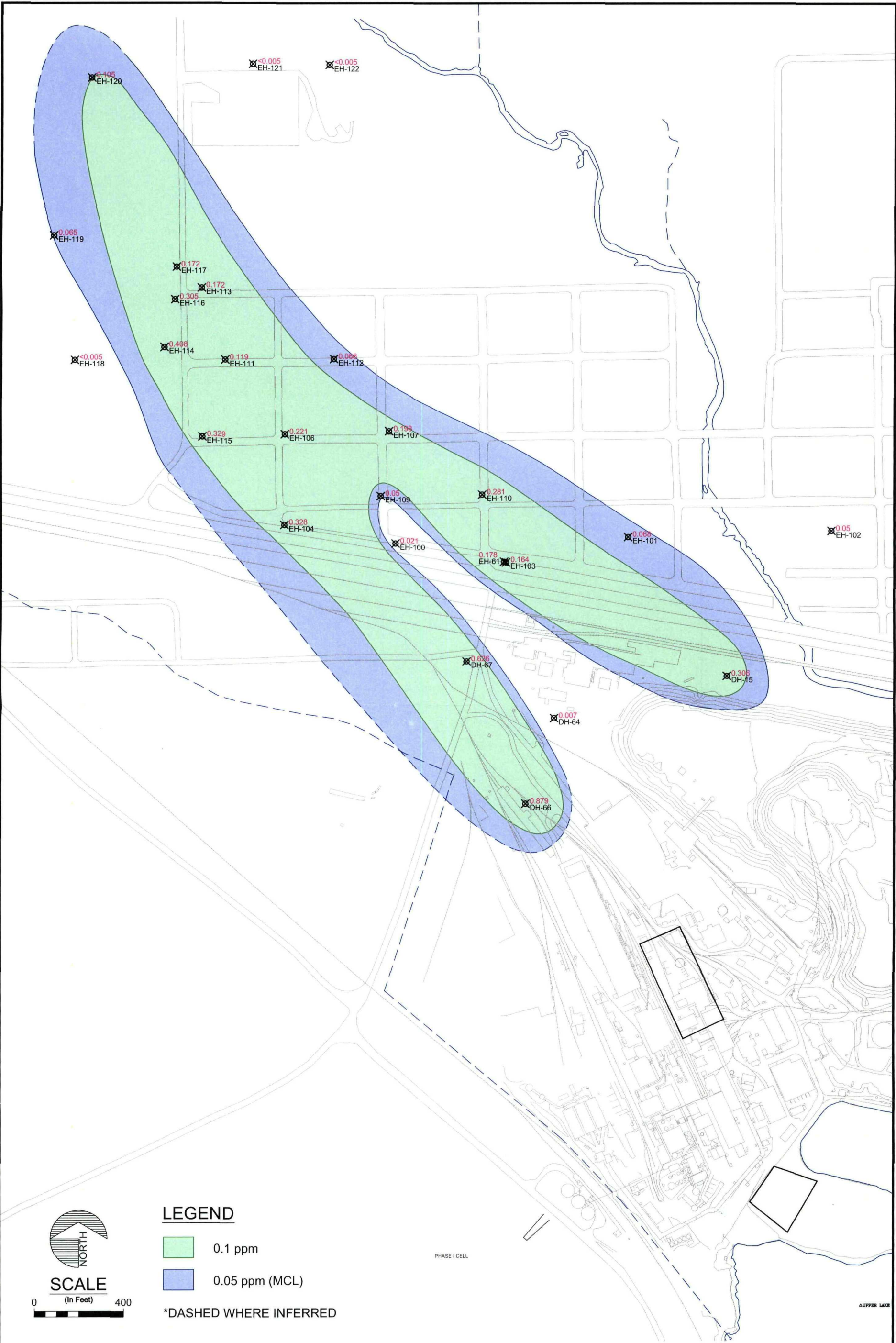
FIGURE
2-8



ARSENIC PLUME MAP
INTERMEDIATE AQUIFER, MAY 2008

FIGURE





**SELENIUM PLUME MAP
INTERMEDIATE AQUIFER, MAY 2008**

FIGURE

PERMEABLE REACTIVE BARRIER WORK

- Pilot-Scale Permeable Reactive Barrier (PRB)
 - Summer 2005, EPA ORD installed pilot-scale PRB to evaluate in situ treatment of arsenic plume with zero-valent iron
 - PRB effectively removes As in areas where capture is attained
 - Pilot-scale PRB located to intersect arsenic paleochannel plume, not to evaluate selenium removal effectiveness
 - Alternative treatment media being evaluated
 - Further work necessary to scope viable technologies for Se removal

RFI PHASE 2 WORK

- Water usage study
- Risk Assessment for Ecological & Human Health
- Additional characterization with broadened parameter list of metals (see attached):
 - Prickly Pear Creek
 - Wilson Ditch
 - Slag pile
 - Acid plant wastewater pond
 - Rail car staging area
 - Tito Park
 - Upper and Lower Lake sediments
 - Old Zinc Plant
- Groundwater Studies
 - Installation of additional wells
 - Modeling and design of boundary control alternatives
 - Additional studies of treatment media

Metals to Be Analyzed

Aluminum
Antimony
Arsenic*
Arsenic (III/V)
Barium
Beryllium
Cadmium*
Chromium
Cobalt
Copper*
Iron*
Lead*
Manganese*
Mercury
Nickel
Selenium
Selenium IV/VI
Silver
Thallium
Vanadium
Zinc*

*Contaminants of Concern Sampled by CERCLA

**Upper Lake Headgate for Irrigation
Water Diversion to Wilson Ditch**



Upper Lake

